

Name _____ Date _____ Period _____

Simplify.

1. $3x^2(2x - 1)$

2. $(x^2 + 6x - 10) - (3x^2 - 6x + 5)$

Fill in the missing box.

3. $x \cdot \square = 4x^3$

4. $5x \cdot \square = 20x^4$

5. $2x \cdot \square = -2x^3$

Divide using long division.

6.
$$\frac{3x^2 + 11x - 70}{x + 7}$$

7.
$$\frac{x^3 - 2x^2 - 5x + 6}{x - 1}$$

8. $(50x^2 - 5x - 35) \div (10x - 9)$

9. $(48 + 3x^3 + 13x^2 - 57x) \div (3x - 5)$

$$10. \quad \frac{45x^3 - 51x^2 - 3}{9x + 6}$$

$$11. \quad \frac{10x^4 + 3x^3 - 63x^2 + 50}{2x^2 + 3x - 5}$$

Divide using synthetic division.

$$12. \quad (x^3 - 8x^2 + 10x - 21) \div (x - 7)$$

$$13. \quad (x^5 - 75x^3 - 49x^2 - 40x - 48) \div (x - 9)$$

$$14. \quad (6x^4 + x^2 - 13x + 3) \div (x - 1)$$

$$15. \quad \frac{9x^3 - 55x^2 + 9}{x - 6}$$

Divide using long division.

16.
$$\frac{x^4 - 2x^3 + 3x^2 - 4x + 6}{x^2 + 2x - 1}$$

17.
$$\frac{32x^3 + 28x^2 - 5}{8x + 7}$$

Divide using synthetic division.

18. $(-33x^2 - 36 + 5x^3 - 51x) \div (-8 + x)$

19.
$$\frac{(x^5 + 6x^4 - 22x^2 + 9x - 26)}{x + 5}$$

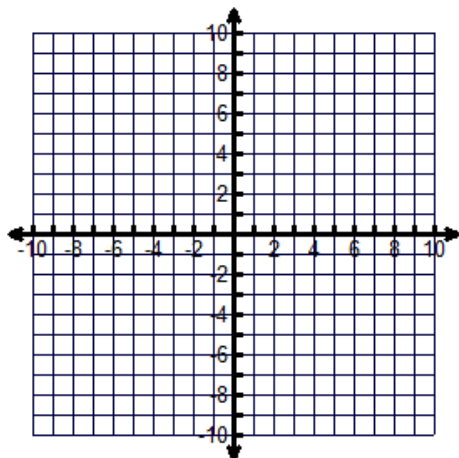
Factor completely.

20. $8x^3 - 27$

21. $8x^2 - 2x - 15$

State the degree and list the zeros of the polynomial. State the multiplicity of each zero and determine whether the graph crosses or touches the x -axis at the corresponding x -intercept. Then sketch a graph.

22. $f(x) = -x^4(3x - 5)$ Degree: _____



Zero	Multiplicity	Touch/Cross

$$\lim_{x \rightarrow -\infty} f(x) =$$

$$\lim_{x \rightarrow +\infty} f(x) =$$